

Under the Aegis of VEDA....



Xtronic

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Department of Electronics and Communication Engineering

Sri Vasavi Engineering College
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VISION

To develop the department into a centre of excellence and produce high quality, technically competent and responsible Electronics and communication engineers

MISSION

To create a learner centric environment that promotes the intellectual growth of the students.

To develop linkages with R & D organizations and educational institutions for excellence in teaching, learning and consultancy practices.

To build the student community with high ethical standards.

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LIFE WITHOUT LIMBS - NICK VUJICIC

Nicholas James Vujicic born 4 December 1982 is an Australian Christian evangelist and motivational speaker born with tetra-amelia syndrome, a rare disorder (called phocomelia) characterized by the absence of arms and legs. He is one of the seven known individuals planet-wide who live with the syndrome.

Imagine getting through your busy day without hands or legs. Picture your life without the ability to walk, care for your basic needs, or even embrace those you love. Meet Nicholas Vujicic (pronounced VOO-yee-cheech). Without any medical explanation or warning, Nick was born in 1982 in Melbourne, Australia, without arms and legs. Three sonograms failed to reveal complications. And yet, the Vujicic family was destined to cope with both the challenge and blessing of raising a son who refused to allow his physical condition to limit his lifestyle.



Throughout his childhood, Nick not only dealt with the typical challenges of school and adolescence, but he also struggled with depression and loneliness. Nick constantly wondered why he was different than all the other kids. He questioned the purpose of life, or if he even had a purpose. According to Nick, the victory over his struggles, as well as his strength and passion for life today, can be credited to his faith in God. His family, friends and the many people he has encountered along the journey have inspired him to carry on, as well.

Since his first speaking engagement at age 19, Nick has traveled around the world, sharing his story with millions, sometimes in stadiums filled to capacity, speaking to a range of diverse groups such as students, teachers, young people, business professionals and church congregations of all sizes. Today this dynamic young evangelist has accomplished more than most people achieve in a lifetime. He's an author, musician, actor, and his hobbies include fishing, painting and swimming. In 2007, Nick made the long journey from Australia to southern California where he is the president of the international non-profit ministry, Life Without Limbs, which was established in 2005. Nick says, "If God can use a man without arms and legs to be His hands and feet, then He will certainly use any willing heart!"

by
16A81A04A5
ECE-B

INNOVATION

ALTERED REALITY

Altered Reality is the future of human-computer interaction as well of the human-reality interaction. Virtual reality, Augmented Reality and Mixed Reality are the terms often cited in context of the emerging interactive technologies particularly in the mobile domain. Of all these forms, augmented reality and mixed reality are considered altered realities. While mixed reality is relatively a new concept, Augmented Reality has been through many developments, applications and successful commercial ventures. In the wake of, all those possibilities where mobile based platforms and wearable embedded devices may find a point of convergence, it is important to consider AR like mobile technology developments seriously by any embedded engineer. Of course, Google Glasses and Microsoft Hololens are some popular products that are result of combining embedded electronics and mobile computing.

Visual Augmentation

Augmented Reality essentially augments visual information (computer generated graphics and 3D images) to the current visual perception of the reality. The augmentation is obviously done on a display which can be either Optical-See-Through (OST) or Video-See-Through. The Optical-See-Through (OST) displays are semi-transparent display screens (Transparent OLEDs or teleprompter glasses) on which digital content can be projected by a processor. The present reality can be seen through the semi-transparent screen where digital content overlays the reality perceived through transparent screen. In case of OST displays, the visual augmentation happens directly on the retina of the human eye.



Audio Augmentation

Augmented Reality not just augments visual content but also the audio content. The audio from the present surrounding is picked using a microphone (like microphone of the smart phone) and is then mixed with computer generated audio and delivered to speakers or headphones. Audio Augmentation serves as important aspect in many AR applications. Like in the AR based navigation apps, audio augmentation can provide real-time voice assistance.

True Augmented Reality

For majority of people, Google Glasses are the ultimate AR example but it is not the true AR product instead it is just an HUD. The digital reality technologies are just at their inception. That is why, the true nature of these, as imagined and aspired by the developers is usually not known and revealed to the masses (probably till AR and others, to their true form see the light of day). The true nature of Augmented Reality can be understood by the following factors -



AR is 3D :- Augmented Reality adds digital content to present reality. Human eyes see the world as 3-dimensional images. So, AR involves merging computer generated 3D images to the current perception of reality. A major challenge before AR is generation of high resolution 3D images that will look more life-like rather than being some animated stuff.

AR is Real-Time :- The current reality must be captured and merged with virtual content in real-time. In AR, virtuality and reality must be

merged at every instant of time frame to frame and frame by frame. Any lag in capturing the reality or merging virtuality would fail to generate a true immersive experience.

AR must be interactive - The user must be able to interact with the altered reality generated through AR. The AR must be able to sense user movement (like location and movement of smart phone in mobile AR apps) and alter virtual content on screen accordingly. The user must also be able to interact with the virtual content like move, remove or explore virtual content.

Registration and Tracking

Augmented Reality means adding virtual content to a real-time perception such that the virtual content seems to be inherent part of the reality. The process of capturing reality and superimposing virtual content to absolute positions in surrounding space is called 'Registration'. The process of tracking user movement and altering the on-display content showing altered reality is termed 'Tracking'. So, Registration let to know where things are in space and tracking let them move in or out of perception or let user explore things according to the user movements. The registration and tracking needs to be done in real-time. Like by registration in real-time, new things added to the present reality must be perceived at any instant of time immediately while tracking in real-time must let user interact with altered reality without any delays and interruptions.

Mobile AR

The most common applications of Augmented Reality have been developed on the mobile platform. Mobile AR uses Video-See-Through display as smart phones capture reality from their embedded cameras and augment reality on their LCD or LED screens. The mobile AR is

differentiated by the registration and tracking technique. There are two registration and tracking techniques used in mobile AR applications -

- 1) Sensor based AR (Location Based)
- 2) Computer Vision based AR

In Sensor based AR, the location (GPS) and Orientation (Accelerometer, Gyroscope and Magnetometers) sensors are used to track the current location and movements of the user. On the basis of the location and orientation information, the virtual content is registered in the physical reality. The location sensor is generally GNSS (Global Navigation Satellite System) receiver. The most popular GNSS receiver is GPS (Global Positioning System) maintained by United States. Other GNSS systems developed or under development include GLONASS (maintained by Russia), Galileo (under development by Europe to be launched by 2020), BeiDou Navigation Satellite System (BDS or BeiDou-2, under development by China to be launched by 2020), NAVigation with Indian Constellation (NAViC, under development by India) and Quasi-Zenith Satellite System (QZSS under development by Japan).



Popular mobile AR applications using sensor based AR include AR browsers (which let graphical information about the things around to show up by sensing user location and surrounding objects), Pokémon GO (AR based gaming app) and AR based navigation apps. However, sensor based AR technique is not much successful when the objects in reality are far from the line of sight or when the real objects in case may not necessarily have a fixed geographical location.

The other AR technique used in mobile AR is computer vision based. In this technique, image processing is used to identify the surrounding objects and virtual content is registered to the reality based on the identification of the object. This can be marker based or marker less. Like many camera apps use marker based face identification to tag people or add virtual text or images to the captured image. While some AR based camera apps like Snapchat use marker less AR to identify faces and superimpose virtual stickers.

Mobile AR Architecture -

Mobile AR apps have similar architecture as of any other mobile application. Any mobile AR app has an application layer, AR layer and Operating System layer. The application layer deals with generation of virtual content and its on-screen management. The AR layer deals with registration of the virtuality and reality and tracking of user movement. The operating system (OS) layer provides the tools and libraries for AR layer to interface with mobile platform. The OS layer does not provide any AR functionality but it enables the AR layer to work on a mobile

platform. For example, display module in AR layer can access the mobile camera only through OS layer.

On android, Google Android API and JMonkey Engine form the operating system layer. On IOS, Core Services Layer provides the OS layer to an AR app.

How AR apps work

The AR applications using Video-See-Through displays first access video from a camera and show the captured images on the screen. The camera parameters for the captured video are matched with the parameters of the virtual space. Then either sensor data is matched with the video parameters or image processing is used to identify objects in the captured video to locate and superimpose virtual content to fixed locations of the altered reality. Once the virtual content is correctly registered, the user movements are tracked to alter virtual content. In case of Optical-See-Through displays, the only difference remains that only virtual content is rendered on the screen though



the reality is still captured by a camera. This is the main control loop of any AR application whether it is developed for mobile platform, desktop based systems or for gadgets equipped with compact embedded electronics. This control loop forms the main activity of the AR apps in case of mobile AR. This control loop repeats infinitely till the AR application runs.

The electronic components essentially required for computer vision based AR development are camera, processor that can run an operating system and a display screen (Like LCD, LED or Transparent OLED). The processor and operating system must be capable of rendering 3D images in real-time apart from capturing video and displaying the superimposed video content on display screen. For sensor based AR development, sensors like accelerometer, gyroscope and magnetometer are additionally required.

For beginning AR application development, mobile platform is the most suitable considering ease to start off with and scope for commercial returns of the entire venture. The desktop or embedded platforms can be chosen for niche AR applications that may require a dedicated electronic setup and entirely different sophisticated software development.

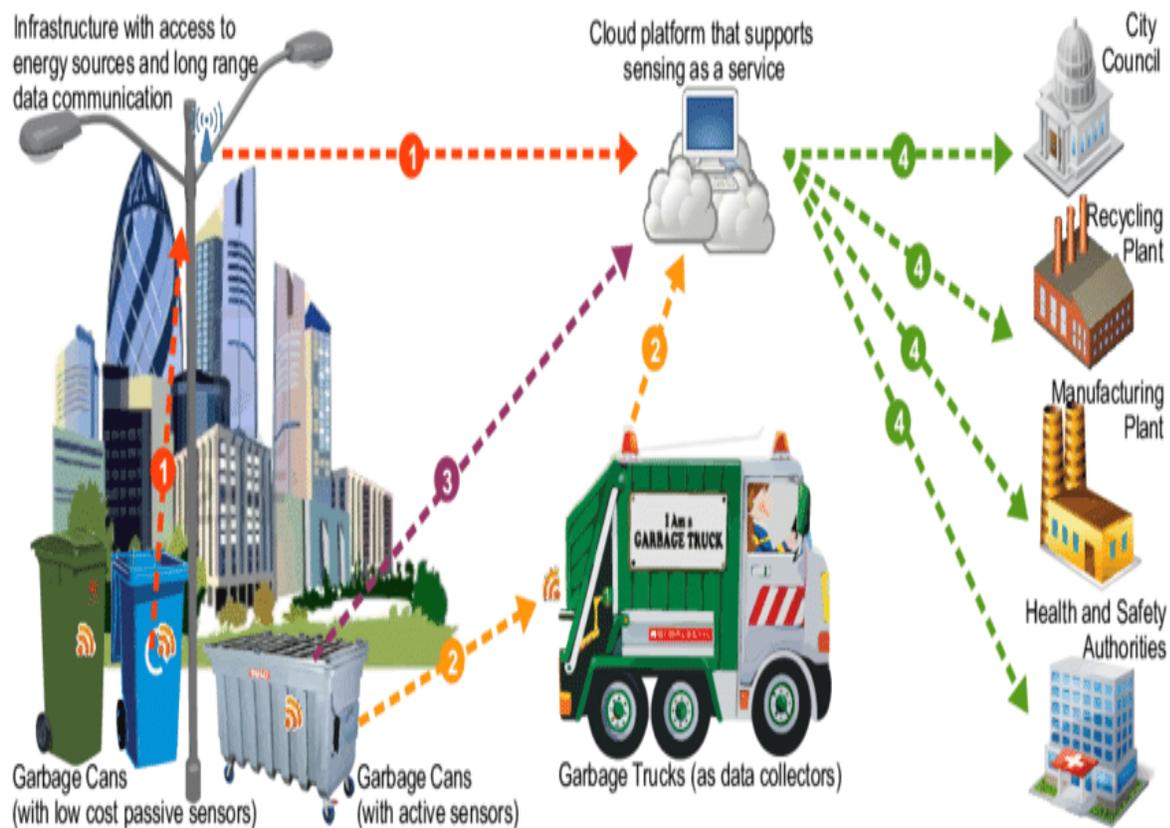
by

Tejaswi Devina
16A81A0D8

CURRENT ISSUE

WASTE MANAGEMENT

In India the last three years have seen hazardous waste import increased by 48%. In 2009 6.4 million tones of hazardous waste came from the west to India and 5.9 million tones was produced domestically. Much of this waste was metal, electronics and plastics. They may have contaminated with lead, mercury and other toxins which can cause serious illness and environmental damage. The brass import increased by 60%. Battery waste import doubled. Municipal ash import rose 70 times. Iron and stainless waste steel import increased by 40%. Plastic waste import increased seven times.



The government is supposed to monitor the import of hazardous waste which enters India through a gap in the law that allows the import of waste for recycling. Most of the ports in India do not have radiation scanning technology. Workers processing hazardous waste use their eyes to tell the difference. Most of the waste enters through ports of Mumbai, Chennai, Calcutta, Cochin and Visakhapatnam.

Waste comes to distribution centers like West Delhi's Monika and Mumbai's Dharavi before being taken away by different agents to specialty processing markets like Seelampur in Delhi. Agents sell the components to others who sell them to factories. The finished recycled products much cheaper than their branded counterparts are sold in the wholesale markets. In New Delhi Seelampur is the biggest market for second hand electronic parts. But most of the shops here are not registered as legal recyclers which have deterred the entry of legal recyclers. The informal sector gets 95% of the business as they do not pay the cost to meet the environment norms. When a court order shut down all plastics burning in Seelampur five years ago, the industry merely shifted 8 kms away.

India has a capacity to handle just 30% of its domestic waste. India's capacity to treat hazardous waste is not growing at the same pace as waste generations. Although recycling industries are temporarily profitable; the damage to the environment is often permanent. Near Moradabad, the waters of the once –fertile Ramganga river have turned black with plastic ash. With no government control and little regard for the environment, the private waste-processing industry poses a threat to public safety in India.

By
Sai Padmini.
17A85A0412

**Denise sees the fleece, Denise sees the fleas.
At least Denise could sneeze and feed and
freeze the fleas. --J Mounika ,16A81A04D7**

CAREER GUIDANCE

SCIENTIST AT ISRO

ISRO stands for the Indian Space and Research Organization which has its headquarters in Bangalore in the state of Karnataka. ISRO is the face of all the space and the extraterrestrial research and is also responsible for all the aeronautical explorations from our country.

1. To become a scientist at ISRO one first needs to have opted Math and Physics as his subjects at 10+2 level and have a thorough basic knowledge of these subjects.
2. Getting admission in IIST (Indian Institute of Space Science and Technology) can be the easiest ticket to get absorbed in ISRO as a scientist/engineer.
3. ISRO often picks up graduates and post-graduate engineers from IITs, NITs and other reputed government and private institutions. So it is better to have a degree in a course that is more likely to be shortlisted for the consideration of such jobs such as B.Tech in Aerospace Engineering, Mechanical Engineering, Radio Engineering, and Engineering Physics. There is sometimes a requirement of electronic engineers and developers as well. There are sometimes vacancies for Civil Engineers as well.
4. One would need to make sure that his/her record stays academically good throughout as the selection criteria set by ISRO for hiring a fresher as a scientist is not very tolerant at its thresholds, so to stand out is an essential requirement.
5. After completing B.Tech from any college, an examination namely ICRB (centralized Recruitment Bangalore) is conducted by ISRO and individuals are tested as per their respective branches of engineering and after clearing the interview, one can get appointed as a scientist or an engineer at ISRO. Candidates must have a minimum aggregate percentage of 65% and above in B.tech in their respective relevant streams.
6. After the completion of M.Tech or D. in trades such as Geoinformatics, Remote Sensing, Instrumentation, applied Mathematics, Geophysics, Geography or any other equivalent degree in the field of Physics or Mathematics one can apply directly for the job of a scientist at ISRO. The selection consists of written exam and Interview and after clearing these stages scientist/Engineer position can be obtained in ISRO.
7. One can get selected as the junior research fellow in ISRO; by this, they can get to research as scientists and engineers. The screening process for the selection of Scientist in such an organization is very tough and requires the best of knowledge, wits and a very presentable and calm attitude.

The job of a scientist requires deep knowledge and a mindset for tackling tricky and patience testing problems, it is not necessary that these traits would be inherited by each and every person but to remember that these could as well be the key to one's selection is a big reason to enhance them. With these skills, being good on record is also very important.

The job as a scientist at ISRO is as much demanding as good as it sounds. Agencies that work in the field of space explorations are not very abundant as the cost of the activities and projects carried out by them is very high and requires huge funding.

by
E Kusuma Kumari
HOD, ECE

LIMERICKS

A Time Capsule

*Some say the world will end in fire,
Some say in ice.
From what I've tasted of desire
I hold with those who favor fire.
But if it had to perish twice,
I think I know enough of hate
To say that for destruction ice
Is also great
And would suffice.....*

by
Lakshmiharika kuppila
16A81A0418,ECE-A.

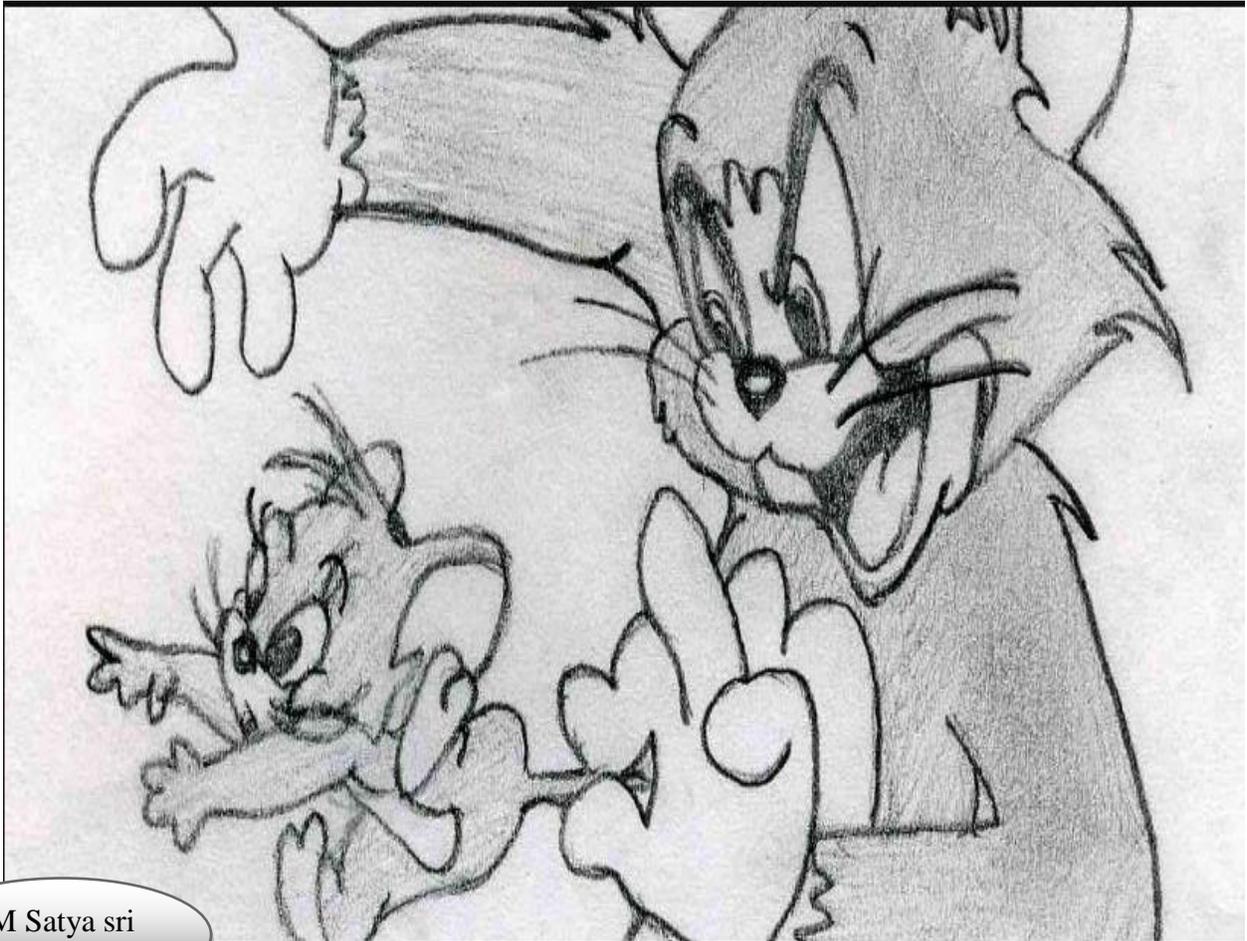
The Life Of A Cupcake

*They put me in the oven to bake,
Me, a deprived and miserable cake,
Feeling the heat, I started to bubble,
Watching the others, I knew I was in
trouble.*

*They opened the door and I started my
life.
Frosting me with a silver knife,
Decorating me with candy jewels,
The rest of my batch looked like fools.*

*Lifting me up, she took off my
wrapper.
Feeling the breeze, I wanted to slap
her.
Opening her mouth with shiny teeth
inside,
This was the day this cupcake died.*

FROM BOOKS TO CANVAS



M Satya sri
16A81A04F2

If you understand, say "understand".

If you don't understand, say "don't understand".

But if you understand and say "don't understand".

how do I understand that you understand. Understand!?



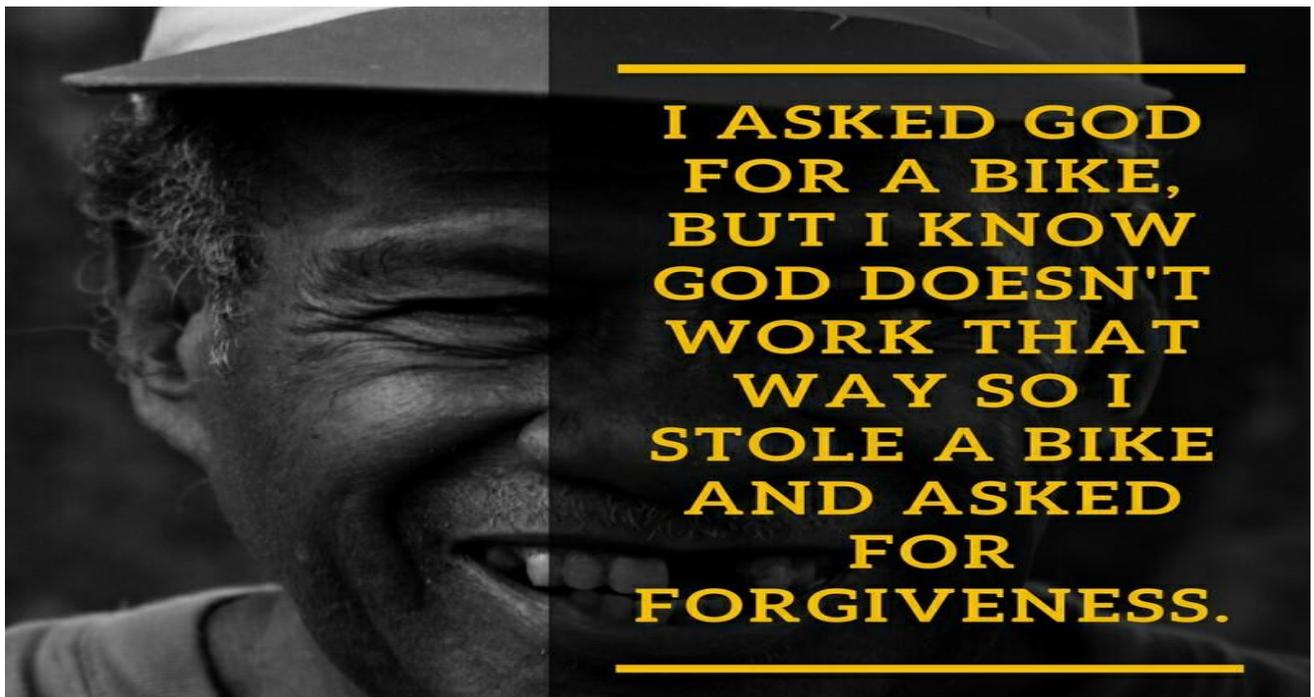
N Pradeepthi
16A85A0438

JOKES

Patient: Doctor, I have a serious memory problem. I can't remember anything!

Doctor: So, since when did you have this problem?

Patient: What problem?



Teacher :What happened in 1809?

Student: Abraham Lincoln was born.

Teacher :What happened in 1819?

Student: Abraham Lincoln was ten years old

Teacher: What are some products of the West Indies?

Student: I don't know.

Teacher: Of course, you do. Where do you get sugar from?

Student: We borrow it from our neighbour.

by
V.JayaLakshmi
17A81A04G9

PROJECT IDEA

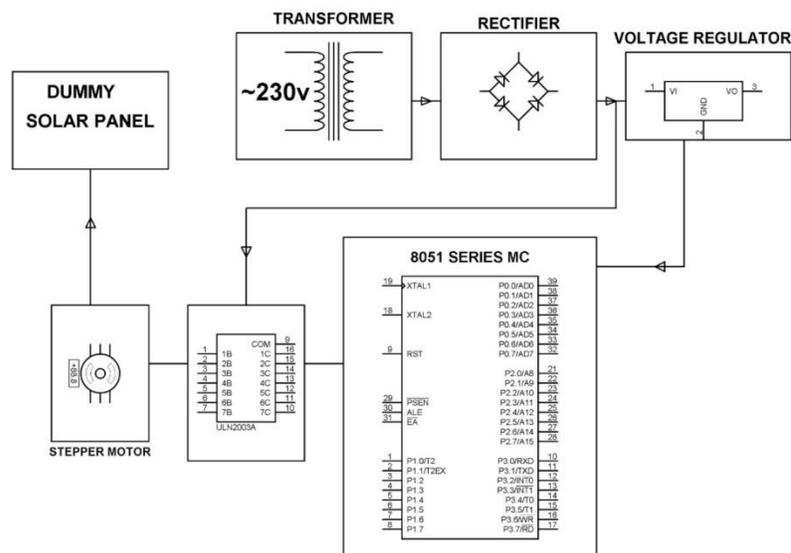
Automatic Solar Tracking System (ASTS)

Introduction:

Automatic Sun Tracking System is a hybrid hardware/software prototype, which automatically provides best alignment of solar panel with the sun, to get maximum output (electricity). The project uses a solar panel coupled to a stepper motor to track the Sun so that maximum sun light is incident upon the panel at any given time of the day. This is better compared to light sensing method that may not be accurate always for example during cloudy days.

BLOCK DIAGRAM:

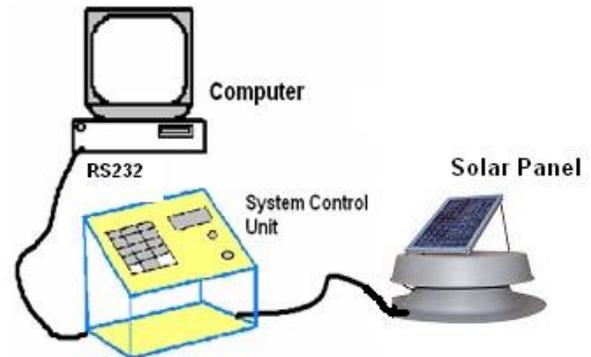
With the impending scarcity of nonrenewable resources, people are considering to use alternate sources of energy. From all other available resources sun energy is the most abundant and it's comparatively easy to convert it to electrical energy. Use of solar panel to convert sun's energy to electrical is very popular, but due to transition of the Sun from east to west the fixed solar panel may be able to generate optimum energy. The proposed system solves the problem by an arrangement for the solar panel to track the Sun.



This tracking movement is achieved by coupling a stepper motor to the solar panel such that the panel maintains its face always perpendicular to the Sun to generate maximum energy. This is achieved by using a programmed microcontroller to deliver stepped pulses in periodical time intervals for the stepper motor to rotate the mounted panel as desired. The microcontroller used in this project is from 8051 family. The stepper motor is driven by an interfacing IC as the controller is not capable of handling the power requirements of the stepper motor. The project is provided with a dummy solar panel which can be used for demonstration purpose only. Further the project can be enhanced by using RTC (Real Time Clock) to follow the Sun. This helps in maintaining the required position of the panel even if the power is interrupted for some time.

Circuit Requirement:**The software includes:**

- VB 6.0 based GUI.
- Microsoft Access database.
- Embedded Software (written in C) for microcontroller AT89c52.

**The hardware includes:**

Solar panel assembly structure containing six functional sensors, stepper motor and solar cells.

System Control Unit containing LCD, Keypad, Error Indicators and Emergency Stop switch.

Complete PCB containing two microcontrollers (89c52). First one is the “*Master Microcontroller*” which controls the automatic operation of ASTS. While second one, the “*Slave Microcontroller*” serially communicates (RS232) with VB software in computer.

Advantages:

- Solar trackers generate more electricity than their stationary counterparts due to an increased direct exposure to solar rays.
- There are many different kinds of solar tracker, such as single-axis and dual-axis trackers, which can help you find the perfect fit for your unique job site. Installation size, local weather, degree of latitude, and electrical requirements are all important considerations that can influence the type of solar tracker that’s best for you.
- Solar trackers generate more electricity in roughly the same amount of space needed for fixed tilt systems, making them ideal optimizing land usage.

Disadvantages:

- Solar trackers are slightly more expensive than their stationary counterparts, due to the more complex technology and moving parts necessary for their operation.
- Some ongoing maintenance is generally required, though the quality of the solar tracker can play a role in how much and how often this maintenance is needed.

by

V.Jayalakshmi
17A81A04G9

RIDDLES

- ❖ The more you take, the more you leave behind. What am I ?

Foot steps.

- ❖ Why is an island like the letter T?

They're both in the middle of water.

- ❖ How do you make the number one disappear?

Add the letter G and then presto—it's Gone!

- ❖ How many bananas can you eat if your stomach is empty?

Just one—after that, it's not empty anymore.

- ❖ A rooster laid an egg on top of the barn roof. Which way did it roll?

It didn't roll – since when did roosters start laying eggs.

- ❖ An electric train is moving north at 100mph and a wind is blowing to the west at 10mph. Which way does the smoke blow?

There is no smoke with an electric train.

- ❖ Which is heavier, a pound of bricks or a pound of feathers?

The same – a pound is a pound!

- ❖ What is full of holes but can still hold water?

Sponge.

- ❖ How many months have 28 days?

All 12 months!

by
M. Vani
16A85A0436, ECE-C

WHY & HOW MEDITATION

Meditation is the art and skill of paying attention

Powerful Benefits of Meditation

1. Lowers **stress levels**
2. Enhances **immune function**
3. Grows **gray matter** and makes your **brain more plastic**
4. Provides better focus and helps **regulate attention**
5. Improves **regulation of emotions**
6. Heightens **self-awareness**
7. Slows down your **brainwave patterns**
8. Strengthens discipline and **self-control**
9. Reduces **anxiety**
10. Promotes **better sleep**
11. Increases **compassion**
12. Lowers **blood pressure**
13. Reduces **physical pain**
14. Enhances **creativity** (divergent thinking)
15. Strengthens **immune function**
16. Elevates **mood**

A One-Minute Meditation Guidance

The idea is to focus your attention on one particular “object.” That object can be your breath, a part of your body, a repeated sound (mantra), physical sensations, your thoughts, or awareness itself. The object of focus isn’t what’s important; maintaining your attention on that object is.

Start by turning your attention to your breath. Notice how your body naturally breathes—inhale, exhale. When you notice your attention wander, bring your awareness back to your breath. You can focus your attention on the sensation of the air passing through your nasal passage or the air entering your lungs.

End this meditation after a minute or two.

by
K Purnima Sharma
Assoc. Prof, ECE

FACULTY ARTICLE

Know about Electronics Applications in Medical Field

In an era of Electronics&Communication Engineering, we are using electronics for various applications in medical electronics, by that we are able to modify the medical treatment. Non medical professionals may also [monitor the health problems](#) by the use of easy medical electronics. Below are the engineering applications which will be designed for medical electronics. These applications made medical field very simple and perfect identification of diseases. Medical electronics are most widely developing fields of this era. Medical electronics are finding cures for almost all diseases and to implement treatment.



By using medical electronics doctors and surgeons can do medical examinations in a very smart way. Medical electronics provides sophisticated equipment with precision. Without medical electronics, it will be difficult for doctors to identify particular disease with which a person is suffering.

Medical Electronics Applications

Medical Electronics applications includes the following devices.

- ❖ **Blood gas analyzer** The best application of electronics in the medical field is gas analyzer. It is used to calculate the pressure of the chemical elements like carbon monoxide, nitrogen, oxygen in blood. By analyzing results we able to understand if any disorder in blood, particularly after we feel sick quite 2days. By exploiting results we are able to observe if any disorder when we feel sickness within the basic level solely within the home. It is often enforced as medical electronics projects.



- ❖ **Blood Glucose Monitor** Blood glucose monitor is used to calculate glucose level of diabetic patients. These devices are often designed as medical [electronic projects](#). The working of blood glucose monitor is, when a little drop of blood is placed on the chemical strip, the strip has sensors to live content of various chemical components, within seconds it will calculate

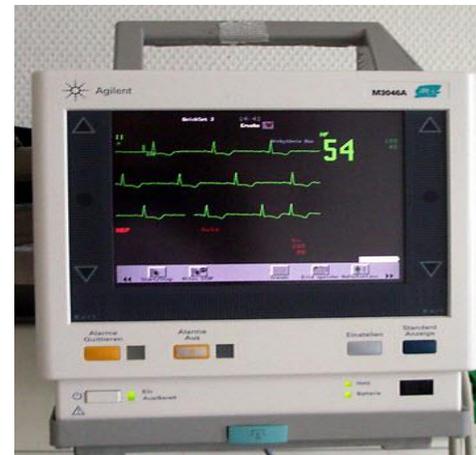


the amount of glucose in the blood and displays by using a LED display.

- ❖ **Electronic Brain Wave Machine** Brain wave machine is one type of instrument in medical electronics which is used to record the electrical activity of the scalp with Electroencephalography by firing of neurons within the brain. It processes the data that has taken from the electrodes which are placed on the scalp and can be displayed within the screen. It is helpful in the treatment of disorders of brains like sleeping disorder, brain death, and mental unhealthiness, also in emergency units at hospitals. These types of electronic devices are used in the medical field in the treatment of mental issues.



- ❖ **Electronic Cardiac Monitor** The Electronic Cardiac Monitor is used in all medical electronics applications. This medical electronic device is used to display the electrical and pressure waveforms of the cardiac system. By inserting specific electrodes on the various elements of the body we can get ECG of the cardiac system. It will observe irregular activity within the cardiac system and heart issues. It is used throughout medical treatment and especially while surgery.



- ❖ **Digital Thermometer** The digital thermometers are used to sense the temperature of the body and these devices are portable, have permanent probes, and a convenient digital display. These devices are used in different industries to control processes in scientific research, the study of weather and in medicine.



- ❖ **IR Thermometer** IR thermometer is used to measure the temperature by detective work with radiation generated by the body. These devices are often used in airports for defectively knowing the condition of passenger's health from a distance to observe the diseases like viral hemorrhagic fever like EBOLA, SAARC etc. This system consists of a lens to focus the



infrared (IR) energy onto a target body, and detects the energy, and displayed in the form of electrical signal which will be displayed in units of temperature.

- ❖ **Defibrillator** Defibrillator is used in emergency conditions like heart attack occurs. It affects the rhythm of the heart such as ventricular fibrillation, cardiac arrhythmia and pulseless ventricular tachycardia. The working procedure of the Defibrillator involves, when the electric shock delivers to the heart, it causes depolarization of the muscles of the heart and regenerates normal conduction of the electrical pulse of the heart. There are different types of defibrillators include implanted, trans venous and external defibrillators.



- ❖ **Sphygmomanometer** The sphygmomanometer is a device used to measure blood pressure (BP), composed of an inflatable cuff to control blood flow and a mercury to measure the pressure. The standard unit of measurement of BP is millimeters of mercury (mmHg) as directly measured with a manual sphygmomanometer. These devices are classified into two types they are Mercury Sphygmomanometers and Aneroid Sphygmomanometers.



- ❖ **MRI (Magnetic Resonance Imaging)** The medical resonance imaging technique is used in radiology, to review the natural object of inner elements of the body. They use strong magnetic fields to make pictures of the body. Magnetic resonance imaging includes a big selection of applications in diagnosing and there calculable to be over scanners in use worldwide. MRI has an effect on identification and treatment in several specialties, though the effect on improved health outcomes is unsure. Since magnetic resonance imaging doesn't use any radiation its use is usually recommended in preference to CT once either modality might yield a similar information. Contraindications to magnetic resonance imaging body most tube-shaped structure implants and cardiac pacemakers, shell gold and foreign bodies within the orbits. The protection of magnetic resonance imaging throughout the primary trimester of physiological condition is unsure; however, it's going to be desirable to different choices.



by
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